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VISTEON C/O BRINKS HOFER GILSON & LIONE PO BOX 10395 CHICAGO, IL 60610			SHAPIRO, LEONID	
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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.		Applicant(s)	
	09/939,267		WEINDORF, PAUL F.L.	
	Examiner		Art Unit	
	Leonid Shapiro		2673	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-17 and 20-26 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-17, 20-26 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|--|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date ____ | 6) <input type="checkbox"/> Other: ____ |

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

1. Claims 1-2, 5-7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Guthrie et al. (US Patent No. 6,323,598 B1) in view of Fregoso (US Patent No. 6,724,156 B2) and Perry (US Patent No. 6,150,771).

As to claim 1, Guthrie et al. teaches a light emitting diode device (See Fig. 1, items 104a, 104b. Col. 3, Lines 39-46), comprising:

a plurality of light emitting diodes connected together in series (See Fig. 1, items L1, L2, Col. 3, Lines 51-61);

a plurality of parallel elements connected in parallel with a plurality of light emitting diodes (See Fig. 1, items Z1, Z2, Col. 4, Lines 51-65).

Guthrie et al. do not show a current monitor connected with the plurality of light emitting diodes that measures an amount of current flowing from the plurality of light emitting diodes and generates a current flow signal; and a voltage converter that supplies a current to the plurality of light emitting diodes as a function of current flow signal and commanded current signal.

Fregoso teaches a current monitor connected with the plurality of light emitting diodes that measures an amount of current flowing from the plurality of light emitting

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diodes and generates a current flow signal (See Fig. 2, item 38, Col. 3, Lines 13-24); and a voltage converter that supplies a current to the plurality of light emitting diodes as a function of current flow signal (See Fig. 2, items 38, 26, Col. 3, Lines 13-46) and commanded current signal (See Fig. 2, items 24, 28, 30, Col.3, Lines 28-37).

It would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate the driving circuit as shown by Fregoso in the Guthrie et al. apparatus in order to enable efficient light producing device (See from Col. 1, Line 67 to Col. 2, Line 2 in the Fregoso reference).

Fregoso and the Guthrie et al. do not show the voltage converter being in electrical communication with plurality of parallel elements to automatically increase a voltage across a parallel element of the plurality of parallel element based on the current flow signal, thereby causing the current flow through the parallel element and around a light emitting diode of the plurality of light emitting diodes upon an open circuit failure of the light emitting diode.

Perry teaches the voltage converter being in electrical communication with plurality of parallel elements to automatically increase a voltage across a parallel element of the plurality of parallel element based on the current flow signal, thereby causing the current flow through the parallel element and around a light emitting diode of the plurality of light emitting diodes upon an open circuit failure of the light emitting diode (See Fig. 13, items 160A, 164, Col. 9, Lines 47-58).

It would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate the driving circuit as shown by Perry into Fregoso and the

Guthrie et al. apparatus in order to minimize a reduction in light output in case of LED failure (See Col. 3, Lines 24-28 in the Perry reference).

As to claim 2, Fregoso teaches the commanded current signal comprises a direct current signal (See Fig. 2, item 22, Col. 3, Lines 13-14).

As to claim 5, Guthrie et al. teaches the plurality of parallel elements comprises a plurality of zener diodes (See Fig. 1, items Z1, Z2, Col. 4, Lines 51-65).

As to claim 6, Guthrie et al. teaches a parallel element is connected in parallel with a light emitting diode (See Fig. 2, items L1, L2, Z1, Z2, Col. 6, Lines 43-56).

As to claim 7, Guthrie et al. teaches a parallel element is connected in parallel with multiple light emitting diodes (See Fig. 1, items Z1, Z2, L1-L4, Col. 4, Lines 51-65).

2. Claims 3, 8-10, 16-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Guthrie et al. and Fregoso, Perry as applied to claim 1 above, and further in view of Swanson et al. (US Patent No. 6,362,578 B1).

As to claim 3, Guthrie et al. and Fregoso, Perry do not show the commanded current signal comprises a pulse width modulated signal.

Swanson et al. teaches the commanded current signal comprises a pulse width modulated signal (See Fig. 1, items 14, 16, 18, TS-PWM, Col. 6, Lines 58-62).

It would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate teaching of Swanson et al. into Fregoso, Perry and the Guthrie et al. system in order to provide a pulse width modulated signal.

As to claims 8, 16-17, Guthrie et al. and Fregoso, Perry do not show a temperature sensor that measures a temperature associated with at least one of the plurality of light emitting diodes and generates a temperature signal.

Swanson et al. teaches a temperature sensor that measures a temperature associated with at least one of the plurality of light emitting diodes and generates a temperature signal (See Fig. 1, items 96, 98, Col. 3, Lines 63-67 and Col. 4, Lines 31-39).

It would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate teaching of Swanson et al. into Fregoso, Perry and the Guthrie et al. system in order to generate temperature signal.

As to claim 9, Guthrie et al. and Fregoso, Perry do not show a temperature derating circuit that reduces the current to the plurality of light emitting diodes when the temperature signal exceeds a temperature threshold.

Swanson et al. teaches a temperature derating circuit that reduces the current to the plurality of light emitting diodes when the temperature signal exceeds a temperature threshold (See Fig. 1, items 96, 98, Col. 3, Lines 63-67 and Col. 4, Lines 31-39).

It would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate teaching of Swanson et al. into Fregoso, Perry and the Guthrie et al. system in order to use temperature derating circuit.

As to claim 10, Guthrie et al. and Fregoso, Perry do not show a temperature derating circuit adjusts the commanded current signal such that the voltage converter supplies less current to the plurality of light emitting diodes.

It would have been obvious to one of ordinary skill in the art at the time of the invention to use a temperature derating circuit as shown by Swanson et al. in Fregoso, Perry and the Guthrie et al. apparatus in order to provide an efficient duty cycle and voltage control (See Col. 1, Line 34-38 in Swanson et al. reference).

3. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Guthrie et al. and Fregoso, Perry as applied to claim 1 above, and further in view of Boakes (US Patent No. 5,798,468).

Guthrie et al. and Fregoso, Perry do not show the commanded current signal is generated by a microprocessor.

Boakes teaches the commanded current signal is generated by a microprocessor (See Fig. 2, items 44, 46, Col. 3, Lines 13-27).

It would have been obvious to one of ordinary skill in the art at the time invention to use a microprocessor as shown by Boakes in Fregoso, Perry and the Guthrie et al. apparatus in order to visibly read a number (See Col. 1, Line 35-41 in Boakes reference).

4. Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Guthrie et al., Fregoso and Swanson et al. as applied to claim 9 above, and further in view of Malinen (US Patent No. 6,075,595).

Guthrie et al., Fregoso, Perry and Swanson et al. do not show the temperature measures a solder temperature near a light emitting diode.

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Malinen teaches using special solder for LED chips and temperature measuring instrument (See Fig. 2a, items 5, 7, Col. 7, Lines 50-67).

It would have been obvious to one of ordinary skill in the art at the time invention to use a solder for measurement as shown by Malinen in Fregoso, Perry, the Guthrie et al. and Swanson et al. apparatus in order to measure temperature of LED.

Limitation of claim 11 would have been considered as obvious variation of the matter selection of location of temperature sensor which fails patentably distinguish over the prior art.

5. Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Guthrie et al., Fregoso, Perry and Swanson et al. as applied to claim 11 above, and further in view of Berkcan (US Patent No. 5, 555,583).

Guthrie et al., Fregoso, Perry and Swanson et al. do not show the temperature sensor comprises a temperature dependent resistor.

Berkcan teaches the temperature sensor comprises a temperature dependent resistor (See Fig. 2, items 28, 65, Col. 3, Lines 6-25).

It would have been obvious to one of ordinary skill in the art at the time invention to use a solder for measurement as shown by Berkcan in Fregoso, Perry, the Guthrie et al. and Swanson et al. apparatus in order to measure temperature of LED.

6. Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over Guthrie et al., Fregoso, Perry and Swanson et al. as applied to claim 12 above, and further in view of Loewenthal et al. (US Patent No. 5, 712,922).

Guthrie et al., Fregoso, Perry and Swanson et al. do not show the temperature dependent resistor and cathode terminal of a light emitting diode are thermally interconnected.

Loewenthal et al. teaches the temperature dependent resistor and anode terminal of a light emitting diode are thermally interconnected (See Col. 27, Lines 15-30).

It would have been obvious to one of ordinary skill in the art at the time invention to thermally interconnect cathode (instead of anode) of LED and thermistor as shown by Loewenthal et al. in Fregoso, Perry, the Guthrie et al. and Swanson et al. apparatus in order to measure temperature of LED.

7. Claim 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over Guthrie et al., Fregoso, Perry and Swanson et al. as applied to claim 9 above, and further in view of Coulling et al. (US Patent No. 6,084,519).

Guthrie et al., Fregoso, Perry and Swanson et al. do not show the temperature derating circuit comprises a microprocessor.

Coulling et al. teaches the temperature derating circuit comprises a microprocessor (See Fig. 13, items 110, 120, Col. 17, Lines 6-14).

It would have been obvious to one of ordinary skill in the art at the time invention to use microprocessor as shown by Coulling et al. in Fregoso, Perry, the Guthrie et al.

and Swanson et al. apparatus in order to maximize the amount of LED light (See Col.16, Lines 61-63 in Coulling et al. reference).

8. Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over Guthrie et al., Fregoso, Perry, Swanson et al. and Coulling et al. as applied to claim 14 above, and further in view of Murayama et al. (US Patent No. 6,130,700).

Coulling et al. teaches a signal to the voltage converter as a function of temperature correction table (See Fig. 13, items 110, 120, Col. 17, Lines 6-14).

Guthrie et al., Fregoso, Perry, Swanson et al. and Coulling et al. do not show a signal to the voltage converter as a function of temperature correction table.

Murayama et al. teaches a signal to the voltage converter as a function of temperature correction table (See Fig. 4, items 25, 27, 29R, 29G, 29B, 31 Col. 10, Lines 30-49).

It would have been obvious to one of ordinary skill in the art at the time invention to use correction table as shown by Murayama et al. in Guthrie et al., Fregoso, Perry, Swanson et al. and Coulling et al. apparatus in order to implement a power control portion to LED's (See Col.4, Lines 12-15 in Murayama et al. reference).

9. Claim 20 is rejected under 35 U.S.C. 103(a) as being unpatentable over Guthrie et al. and Fregoso, Perry as applied to claim 1 above, and further in view of Sakaguchi et al. (US Patent No. 6,448,951 B1).

Guthrie et al. and Fregoso, Perry do not show plurality of light emitting diodes are adapted to provide back lighting for an active matrix liquid crystal display.

Sakaguchi et al. teaches plurality of light emitting diodes are adapted to provide back lighting for an active matrix liquid crystal display (See Fig. 1, items 3-4, Col. 5, Lines 11-20 and Col. 6, Lines 53-65).

It would have been obvious to one of ordinary skill in the art at the time invention to use plurality of light emitting diodes are adapted to provide back lighting for an active matrix liquid crystal display as shown by Sakaguchi et al. in Guthrie et al. and Fregoso, Perry apparatus.

10. Claim 21 is rejected under 35 U.S.C. 103(a) as being unpatentable over Smith (US Patent No. 5,105,179) in view Guthrie et al. and Perry.

Smith teaches a display unit (See Figs 1-2, item 12, Col. 1, Lines 6-10) adapted for automobile application (See Col. 4, Lines 25-35), comprising:

- a liquid crystal display (See Fig. 6, item 50, Col. 5, Lines 53-62) and;
- a backlighting array (See Fig. 6, item 52, Col. 5, Lines 53-62) comprising a plurality of light emitting diodes in a series configuration (See Fig. 7D, items 236, 238, Col. 8, Lines 16-40).

Smith does not show a plurality of parallel elements connected in parallel with the light emitting diodes.

Guthrie et al. teaches a plurality of parallel elements connected in parallel with the light emitting diodes (See Fig. 1, items Z1, Z2, Col. 4, Lines 51-65).

It would have been obvious to one of ordinary skill in the art at the time invention to use plurality of parallel elements connected in parallel with the light emitting diodes as shown by Guthrie et al. in Smith apparatus in order to prevent a single LED failure (See Col. 4, Lines 60-65 in the Guthrie et al. reference).

Smith and the Guthrie et al. do not show the voltage converter being in electrical communication with plurality of parallel elements to automatically increase a voltage across a parallel element of the plurality of parallel element based on the current flow signal, thereby causing the current flow through the parallel element and around a light emitting diode of the plurality of light emitting diodes upon an open circuit failure of the light emitting diode.

Perry teaches the voltage converter being in electrical communication with plurality of parallel elements to automatically increase a voltage across a parallel element of the plurality of parallel element based on the current flow signal, thereby causing the current flow through the parallel element and around a light emitting diode of the plurality of light emitting diodes upon an open circuit failure of the light emitting diode (See Fig. 13, items 160A, 164, Col. 9, Lines 47-58).

It would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate the driving circuit as shown by Perry into Smith and the Guthrie et al. apparatus in order in order to minimize a reduction in light output in case of LED failure (See Col. 3, Lines 24-28 in the Perry reference).

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11. Claims 22-23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Smith, Perry and Guthrie et al. as applied to claim 21 above, and further in view of Swanson.

Guthrie et al. and Smith, Perry do not show a temperature derating or compensation circuits that reduces the current to the plurality of light emitting diodes when the temperature signal exceeds a temperature threshold that the plurality of light emitting diodes have a substantially consistent luminous intensity.

Swanson et al. teaches a temperature derating circuit that reduces the current to the plurality of light emitting diodes when the temperature signal exceeds a temperature threshold (See Fig. 1, items 96, 98, Col. 3, Lines 63-67 and Col. 4, Lines 31-39).

It would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate teaching of Swanson et al. into Smith, Perry and the Guthrie et al. apparatus in order to provide a temperature derating or compensation circuits.

12. Claim 24 is rejected under 35 U.S.C. 103(a) as being unpatentable over Smith, Perry, Guthrie et al. and Swanson as applied to claim 23 above, and further in view of Chliwnyj et al. (US Patent No. 5,924,784).

Smith, Perry, Guthrie et al. and Swanson do not show a microprocessor based light emitting diode controller that provides a pulse width modulated signal that controls the intensity of the light emitting diode array.

Chliwnyj et al. teaches a microprocessor based light emitting diode controller that provides a pulse width modulated signal that controls the intensity of the light

emitting diode array (See Fig. 1, items 1, 8, Col. 6, Lines 25-57 and from Col. 9, Line 64 to Col. 10, Line 5).

It would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate teaching of Chliwnyj et al. in Smith, Perry, the Guthrie et al. and Swanson et al. apparatus in order to simplify control by using a micro processor and PWM.

13. Claim 25 is rejected under 35 U.S.C. 103(a) as being unpatentable over Muthu (US Patent No. 6,411,046 B1) in view of Guthrie et al. and Perry.

Muthu teaches a method of controlling light emitting diode array (See Fig. 1, items 10, 12, 14, Col. 1, Lines 38-40), comprising:

monitoring a temperature of the light emitting diode array at a node (heat sink) (See Fig. 1, items 18, 33, Col. 3, Lines 12-22) connected with a light emitting diode (See Fig. 1, items 10, 12, 14, 18, 33, Col. 3, Lines 12-22); and adjusting an input current to the light emitting diode array as a function of the temperature (See Fig. 1, items 11, 13, 15, 30, 34, 36, Col. 2, Lines 18-26 and from Col. 3, Line 61 to Col. 4, Line 36).

Muthu do not show a series light emitting array.

Guthrie et al. teaches a plurality of light emitting diodes connected in series (See Fig. 1, items L1, L2, Col. 3, Lines 51-61).

It would have been obvious to one of ordinary skill in the art at the time invention to incorporate teaching of Guthrie et al. into Muthu system in order to implement a series light emitting array.

Muthu and the Guthrie et al. do not show the voltage converter being in electrical communication with plurality of parallel elements to automatically increase a voltage across a parallel element of the plurality of parallel element based on the current flow signal, thereby causing the current flow through the parallel element and around a light emitting diode of the plurality of light emitting diodes upon an open circuit failure of the light emitting diode.

Perry teaches the voltage converter being in electrical communication with plurality of parallel elements to automatically increase a voltage across a parallel element of the plurality of parallel element based on the current flow signal, thereby causing the current flow through the parallel element and around a light emitting diode of the plurality of light emitting diodes upon an open circuit failure of the light emitting diode (See Fig. 13, items 160A, 164, Col. 9, Lines 47-58).

It would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate the driving circuit as shown by Perry into Muthu and the Guthrie et al. apparatus in order in order to minimize a reduction in light output in case of LED failure (See Col. 3, Lines 24-28 in the Perry reference).

14. Claim 26 is rejected under 35 U.S.C. 103(a) as being unpatentable over Muthu, Perry and Guthrie et al. as applied to claim 25 above, and further in view of Fregoso.

Muthu, Perry and Guthrie et al. do not show monitoring a current from the light emitting diode array; and adjusting the input voltage as a function of the current.

Fregoso teaches monitoring a current from the light emitting diode array(See Fig. 2, item 38, Col. 3, Lines 13-24); and adjusting the input voltage as a function of the current (See Fig. 2, items 24, 28, 30, Col.3, Lines 28-37).

It would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate the driving circuit as shown by Fregoso in the Guthrie et al. and Muthu, Perry system in order to enable efficient light producing device (See from Col. 1, Line 67 to Col. 2, Line 2 in the Fregoso reference).

Response to Arguments

15. Applicant's arguments filed 08.08.05 have been fully considered but they are not persuasive:

On page 7, last paragraph and page 8, 1st paragraph Applicant's stated that prior art (Perry) does not suggest the desirability of the combination. However, Perry teaches to minimize a reduction in light output in case of LED failure by connecting in parallel to LEDs **reverse biased zener diodes** (See Col. 3, Lines 24-28).

On page 8, 2nd paragraph, Applicant's stated that Perry and Guthrie et al. have different objectives for driver (converter) circuit. However, rejection is not combining switching from parallel to serial connection of illumination sources (LEDs) (See Abstract in Guthrie et al.), but only parallel connection of **LEDs** and **reverse biased zener diodes** for protection in case of LEDs failure (See in Perry reference Fig. 13, items 160A and 164) with serial configuration of LEDs (See Fig. 1, items L1-L2 in Guthrie et al. reference).

Telephone inquire

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Leonid Shapiro whose telephone number is 571-272-7683. The examiner can normally be reached on 8 a.m. to 5 p.m..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Amr Awad can be reached on 571-272-7764. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

LS
10.11.05

AMR A. AWAD
PRIMARY EXAMINER
